# 60,000 Disaster Victims Speak: Part II. Summary and Implications of the Disaster Mental Health Research

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On the basis of the literature reviewed in Part I of this two-part series (Norris, Friedman, Watson, Byrne, Diaz, and Kaniasty, this volume), the authors recommend early intervention following disasters, especially when the disaster is associated with extreme and widespread damage to property, ongoing financial problems for the stricken community, violence that resulted from human intent, and a high prevalence of trauma in the form of injuries, threat to life, and loss of life. Meeting the mental health needs of children, women, and survivors in developing countries is particularly critical. The family context is central to understanding and meeting those needs. Because of the complexity of disasters and responses to them, interagency cooperation and coordination are extremely important elements of the mental health response. Altogether, the research demands that we think ecologically and design and test societal- and community-level interventions for the population at large and conserve scarce clinical resources for those most in need.

A substantial amount of research pertinent to understanding the effects of disasters has been published over the past 20 years. Part I of this review described results for 160 distinct samples composed of over 60,000 individuals who experienced 102 different events (Norris, Friedman, Watson, Byrne, Diaz, and Kaniasty this volume). These samples' experiences and outcomes were studied using a variety of designs, time frames, assessment strategies, and sampling methods. Although American adults were overrepresented in the data, the samples were impressively diverse, including children, adolescents, college students, and older adults as well as middle-aged adults, from 29 countries or territories and five continents. Living in a variety of resource contexts, these survivors experienced almost every imaginable type of disaster, including floods, hurricanes, earthquakes, wildfires, nuclear and industrial accidents, an array of transportation accidents on the ground, in the air, and at sea, terrifying sniper attacks, and bombings that caused unthinkable destruction and death. Individuals' experiences ranged from little more than inconvenience to life-threatening danger, severe injuries, multiple bereavements, and the total destruction of their communities. Accordingly, it is not surprising that psychological outcomes varied across samples from a predominance of transient stress reactions to prevalent and persistent psychopathology. In this companion article, we aim to summarize and interpret the empirical results and to draw implications

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from them for practice in disaster mental health. We begin by describing results for disasters generally and then consider the implications of sample- and individual-level variations in outcomes. We close by providing a few general comments on the state of the art in disaster mental health practice and research.

## OVERALL RANGE, MAGNITUDE, AND DURATION OF EFFECTS

### *Summary of Results*

Six sets of outcomes were observed in these studies. Specific psychological problems, such as anxiety and depression and most notably posttraumatic stress disorder (PTSD), were found most often, followed by nonspecific psychological distress and varying health problems and concerns. Problems in living and psychosocial resource loss were also identified as ongoing sources and manifestations of stress. Youth exhibited additional problems unique to their age groups, such as behavioral problems, hyperactivity, and delinquency, but like adults, they were also vulnerable to PTSD, depression, somatic complaints, and ongoing stress. In interpreting these results, it should be kept in mind that the relative frequencies of these outcomes are a function of how frequently they were assessed as well as how frequently they were observed if assessed.

To provide a rough measure of the overall severity of these effects, we classified each of the 160 samples' results on a 4-point scale. Relatively few samples (11%) showed only minimal or highly transient impairment, whereas approximately half of the samples (51%) showed moderate impairment, indicative of prolonged stress. The remainder showed severe (21%) or very severe (18%) impairment, indicative of clinically significant distress (determined on the basis of percentages scoring above established cutpoints on standardized scales) or criterion-level psychological disorder (determined on the basis of diagnostic instruments).

Moreover, the review showed that the effects of disasters may be quite enduring. Duration cannot be totally divorced from magnitude, as stronger effects are also more likely to persist. In general, the first year was the time of peak symptoms and effects, and people did improve over time. Yet in many studies symptoms lingered for months, even years, for a significant minority of participants. The research also suggests that we may be able to identify the persons who are most at risk for long-term distress fairly early in the process. Delayed onset of symptoms was rare.

### *General Implications for Practice*

The most fundamental conclusion to be drawn from these findings is that disasters do have implications for mental health for a significant proportion of persons who experience them. These effects are multifaceted and frequent; they begin early and often last a long time. Why do many disasters have such pervasive and lasting consequences for mental health? The reasons span biological, psychological, and social domains. Not all disasters are traumatic, but many do create the "helplessness in the face of intolerable danger, anxiety, and instinctual arousal" that is the essence of psychic trauma (Eth and Pynoos 1985, p. 38). As Janoff-Bulman (1985) noted, such dramatic events force us to "recognize, objectify, and examine" our most basic cognitions about the world (p. 18). Information processing models (Horowitz 1976) emphasize survivors' need to process the event until it can be assimilated, setting in motion the alternating cycles of intrusion and avoidance that are the hallmark of posttraumatic stress. Moreover, following many disasters, the loss of important attachments is almost unavoidable, and social and community resources deteriorate just when victims need them the most (Kaniasty and Norris 1993). These are not competing explanations but are complementary—perhaps even synergistic—causal mechanisms underlying the adverse effects of disasters.

That individuals who are most at risk for long-term effects can be identified very early in the aftermath of disasters points to a need for screenings and early interventions in disaster mental health. Screening for acute symptoms of distress must be undertaken with caution and sensitivity. The value of early

screenings ultimately rests on the ability to use such data to provide better care. The management of acute stress reactions following disasters includes many components that generally aim to foster resiliency, prevent chronic emotional problems, and minimize long-term deterioration in quality of life. At this time, however, evidence is limited that early intervention following disasters can help prevent longer-term problems and is not adequate either to endorse or to reject any specific approach.

The majority of intervention studies following disaster have addressed the effects of psychological debriefing. Psychological debriefing is received well by many participants, but the majority of methodologically strong studies show that it does not prevent PTSD or other psychopathology (Rose, Brewin, Andrews, and Kirk 1999) and may even worsen psychological symptoms (Mayou, Ehlers, and Hobbs 2000). Recent reviews (Litz, Gray, Bryant, and Adler 2002; Rose, Bisson, and Wesseley 2001) conclude that psychological debriefing should not be practiced routinely in the immediate aftermath of exposure to trauma.

For individuals who require more intense clinical intervention following disasters, cognitive-behavioral treatments (CBT) have received the strongest empirical support. While there is no published research on the effectiveness of early CBT following disasters, there are a number of studies in which 4–5 sessions administered to acutely traumatized individuals resulted in clinical improvement in PTSD symptoms, even at long-term follow-up (Bryant, Harvey, Dang, Sackville, and Basten 1998; Bryant, Sackville, Dang, Moulds, and Guthrie 1999; Echebura, de Corral, Sarasua, and Zubizarreta 1996; Foa, Hearst-Ikeda, and Perry 1995). Some elements of cognitive-behavioral interventions may not be appropriate for those experiencing extreme anxiety, suicide risk, marked ongoing stressors, or acute bereavement (Bryant and Harvey 2000). In such cases, other techniques such as anxiety management, supportive therapy, or pharmacological intervention may be preferable. Although there have been very few studies examining medications for the treatment of acute stress symptoms, Shalev and Ursano (in press) stated that there are both theoretical and experiential reasons to predict that judicious use of certain medications may make a significant difference in the management of acute traumatic stress reactions.

The need for controlled research in this area is critical. Research investigating early intervention following trauma is developing rapidly, however, and it is expected that a variety of controlled outcome studies with a range of trauma populations and delivery environments will be produced within the foreseeable future.

Although much of the preceding discussion has focused on PTSD and acute stress disorder, the breadth of the outcomes observed clearly indicates that we should not focus too narrowly on any one condition in either research or practice. Depression, physical health problems, interpersonal problems, and deteriorating social resources require attention as well. Individual disaster victims need access to a range of medical, psychological, and social services. On the basis of these results, we would advocate for a more comprehensive system of care—one that integrates primary and psychiatric care and one that addresses community and family, as well as individual, needs. We return to these points momentarily.

## SAMPLE-LEVEL PREDICTORS OF VARIATIONS IN IMPAIRMENT

### *Effects of Sample Type*

In our empirical review, we compared results across three sample types: schoolage youth, adult survivors, and rescue/recovery workers. Table 1 shows the sample- or event-level characteristics that appear to be most strongly related to the community's or population's need for mental health assistance. Relative to the risk of adult survivors, risk of severe impairment increased if the sample was composed of youth. It was previously stated that

**TABLE 1**
*Sample- and Event-Level Risk Factors for Postdisaster Mental Health Problems*

| Variable | Group most at risk | Compared to |
|---|---|---|
| Sample type | Schoolage youth | Adults |
| | Adult survivors | Responders |
| Disaster location | Survivors in developing countries | Survivors in developed countries |
| | Survivors in other developed countries | Survivors in the United States |
| Disaster type | Survivors of mass violence | Survivors of natural or technological disasters |
| | Survivors of technological disasters in developed countries | Survivors of natural disasters in developed countries |

the effects of disasters stem from the cumulative or synergistic effects of acute helplessness, instinctual arousal, inability to comprehend and make sense of the world, loss of perceived safety, and loss of important attachments and perceived social support. To this extent this view of the phenomenon is accurate, it follows quite logically that, on average, youth would be less well equipped to cope with disasters than are adults.

Children and adolescents can be helped in a number of ways. In a recent review of prevention and intervention approaches for children exposed to disasters, La Greca (2001) identified only three controlled studies of child treatment following disasters, which clearly points to a critical need for more and better research. On the basis of the available evidence, La Greca concluded that "gradual exposure to traumatic events, with opportunity to reprocess the event in a reparative manner, is a critical component of treating youth with severe levels of PTSD following disaster" (p. 213). The professional must understand what the event means to the child and why the child believes it occurred. La Greca furthermore noted that grief management and anger management are often appropriate, depending upon the nature of the event. Less seriously distressed children may be assisted by means of a school consultation model and manual (La Greca, Vernberg, Silverman, and Prinstein 1994) that aims to help teachers and counselors to increase childrens' social support and promote positive coping. As with adults, efforts to normalize psychological reactions to disaster are assumed to be very important in school-based interventions. Nonetheless, making parents aware of their children's distress, when severe, is a helpful component of school-based need assessments and screenings. Recent research (Pfefferbaum et al. 2001) indicates that it may be helpful to limit children's exposure to media and other graphic depictions of destruction and death.

Relative to the risk of adult survivors, risk of severe impairment decreased if the sample was composed of rescue or recovery workers. In light of recent events in the United States, specifically the September 11 terrorist attack on the World Trade Center and the Pentagon, the effect for recovery workers should be interpreted with caution. While often exposed to horror, these rescue and recovery workers seldom experienced direct losses or extensive bereavement. The heterogeneity of the responder samples was problematic, and as research on this topic grows, it would be advisable to make finer distinctions between responder groups exposed to physical danger (e.g., firefighters), horror and the dead (e.g., body handlers, medical personnel), and vicarious trauma (e.g., counselors). Moreover, our review was restricted to the consequences of single, dramatic events and does not necessarily apply to the consequences of chronic exposure to trauma experienced by occupational groups who respond to survivors and victims of war, sexual assault, or family violence.

These various caveats notwithstanding, it is also possible that we could learn much about the factors that foster resilience in these groups that seem to fare better than objective circumstances suggest they should (Alexander

and Wells 1991). Maturity and experience may buffer the stress of disasters (McCarroll et al. 1996; Norris and Murrell 1988). As Ursano, McCaughey, and Fullerton (1994) noted, construction of meaning is an active process that appears to affect the outcome of a traumatic experience. It is possible that we could learn from the capacity of such workers to support one another and to develop a meaningful narrative about their experience.

*Effects of Disaster Location*

We likewise compared results across three disaster locations: the United States (and its territories), other developed countries, and developing countries. Relative to the risk of American survivors, risk of impairment increased if the sample was composed of individuals from other developed countries and especially if it was composed of individuals from developing countries. This finding may indicate that, outside of the United States, only the most severe events tend to be studied or it may reflect the fact that disasters tend to be more severe when they occur in the developing world. Many of the samples from developing countries survived disasters where death tolls were measured in thousands or even tens of thousands, such as the horrendous Armenian earthquake, the Mexico City earthquake, the Armero volcano eruption, and Hurricane Mitch. If this effect reflects the importance of surviving in a context of massive destruction and death, rather than location per se, it may have relevance for the United States as it now grapples with the aftermath of a disaster of comparable enormity. The difference may also attest to the ability of government services and other resources to make a difference in the lives of disaster victims.

As we noted earlier, we need to provide disaster victims with better-integrated systems of primary and psychiatric care and to foster community-based as well as clinical interventions in disaster-stricken communities. If these needs exist in developed countries, they are profound in developing countries where mental health infrastructures and professionals are often lacking. Guided by the "inverted triangle model" of psychosocial intervention, which is reproduced with permission in Figure 1 (Green et al. in press), the Disaster Committee (Somasundaram, Norris, Asukai, and Murthy, in press) of the United Nations—International Society for Traumatic Stress Studies Joint Initiative on Trauma presented numerous recommendations for community, family, and individual interventions that would be appropriate in the context of most developing countries. No one set of recommendations will apply to all communities cross-culturally. It is important that the activities match the cultural context and needs of the group. The best way to assure this is to involve the community in evaluating its own needs and determining which actions are most suitable.

*Effects of Disaster Type*

As for the influence of disaster type, we compared results across samples experiencing natural disasters, technological disasters, and mass violence. The findings regarding the consequences of experiencing disasters caused by malicious human intent were unequivocal. Samples who experienced mass violence were far more likely than other samples to be severely or very severely impaired. From either an information processing or resource loss perspective, disasters of mass violence may be especially difficult for victims to comprehend or assimilate, making intrusion and avoidance symptoms more likely. Because shooting sprees and terrorist attacks tend to be indiscriminate and random (Stern 1999), they create acute helplessness and anxiety and may be even more likely that other disasters to shatter beliefs of the self as invulnerable and of the world as a meaningful and just place (Janoff-Bulman 1985).

Despite evidence to the contrary (Rubonis and Bickman 1991), it has become widely accepted in the field of disaster research that technological disasters have more adverse consequences than natural disasters because they symbolize human callousness and carelessness. It is time to reexamine our ideas about this. The literature in the field has

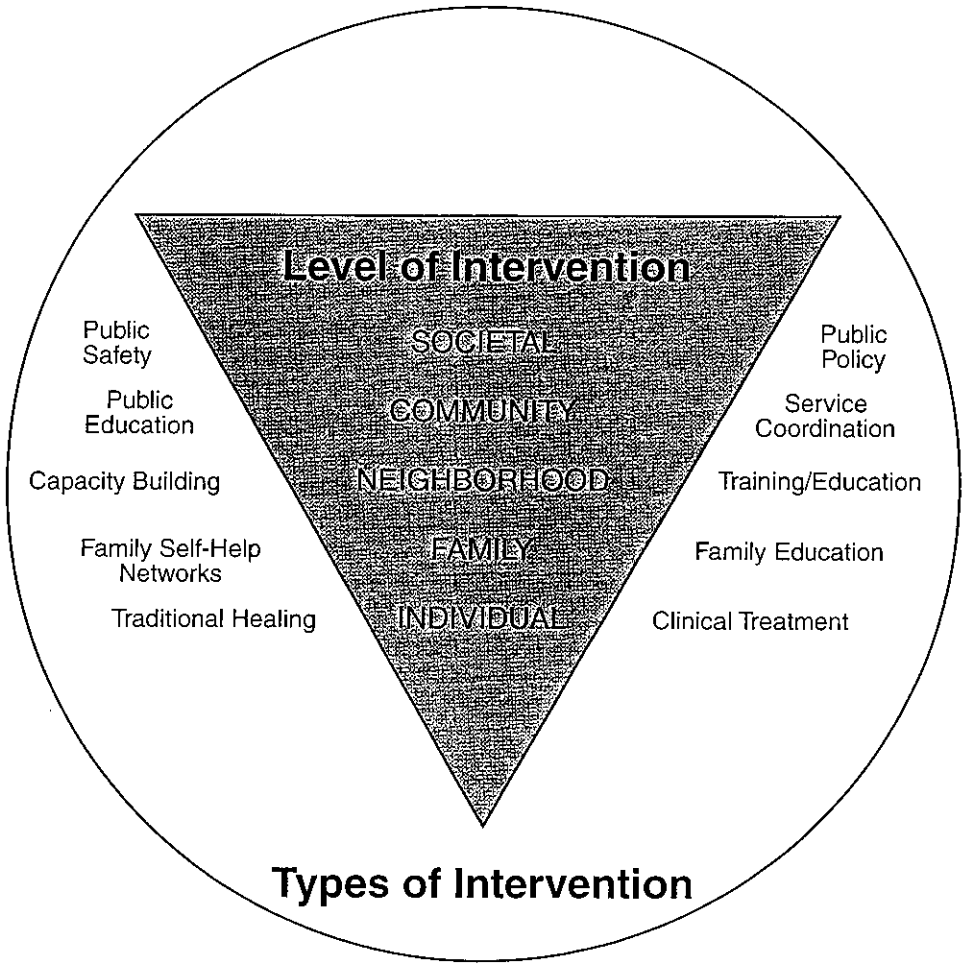


Figure 1.
Inverted triangle model of intervention related to humanitarian crises. Reprinted by permission from Green et al., in press.

changed markedly in the past decade. First, Hurricane Andrew was followed by an extraordinary amount of research, and many of these studies found quite severe effects. Second, international research has mushroomed and many of these studies have examined devastating natural disasters. In our analysis, natural disasters in developing countries yielded a higher mean aggregate severity rating than did either type of disaster in developed countries. Many of our ideas about the course of recovery from natural disasters are based very much on Western experience, where predisaster housing quality, controls over land use, and warning systems are far superior to the norms in developing countries. The destruction caused by natural disasters nearly always has—or is perceived to have—a human element.

### *What Types of Interventions Are Required for What Types of Events?*

It should also be recognized that disasters of a given type varied considerably in their effects. It would be a mistake to focus solely on the cause of the disaster when considering implications of the research for clinical and community interventions. Overall, from the illustrative studies (Norris et al., this volume)

and others similar to them in the database, we conclude that (1) when injuries and deaths are rare, (2) when the destruction or loss of property is confined relative to the size and resources of the surrounding community, (3) when social support systems remain intact and function well, and (4) when the event does not take on more symbolic meanings of neglect or maliciousness, disasters should have minimal consequences for mental health at the population level beyond those associated with transient stress reactions. Such events may compose a minority of those in the published literature, but probably a larger share of real life events in the United States. Such events probably do not require large-scale professional interventions, although crisis intervention strategies that ameliorate the initial stress may be helpful. At a moderate level of impact, ongoing programs that can reduce stress, enhance social support, and provide reassurance about future risk are advisable at the community level. Such programs might encompass mechanisms for identifying and referring the minority of those with more serious impairment for professional treatment.

Disasters that engender severe, lasting, and pervasive psychological effects are rare, but they do happen. On occasion, even natural disasters may be of sufficient magnitude to produce severe and chronic impairment in a substantial portion of the population. Altogether, it appeared that sample- (and presumably population) level effects were greatest when at least two of the following event-level factors were present: (1) The disaster caused extreme and widespread damage to property, (2) the disaster engendered serious and ongoing financial problems for the community, (3) the disaster was caused by human intent, and (4) the impact was associated with a high prevalence of trauma in the form of injuries, threat to life, and loss of life. When such disasters occur, it appears that the need for professional level mental health services will be widespread. Delivering mental health services after such disasters will pose a tremendous challenge but seems to be required. Even in these cases, it is expected that the majority of survivors will not exhibit clinically significant symptomatology or disability. Thus the inverted triangle (Figure 1), which demands that we think ecologically and design societal and community-level interventions for the population at large and conserve scarce clinical resources for those most in need, is a useful image because it reminds us to think ecologically when designing systems of care.

## INDIVIDUAL-LEVEL PREDICTORS OF VARIATIONS IN IMPAIRMENT

### *Risk Factors for Adverse Outcomes*

It is well established that individuals vary markedly in their outcomes even when they have experienced the same event. A variety of factors have been found to influence the likelihood that an individual within a community will develop serious or lasting psychological problems in the wake of disasters. Gender, age, prior experience, ethnicity, culture, socioeconomic status (SES), family structure, problems of children, parents, or spouses, severity of exposure, secondary stressors, predisaster psychiatric history and personality, and a variety of psychosocial resources all appear to play a role. Undoubtedly these factors work together in ways more complex than captured in the research to date and, in fact, interactive effects of these risk factors often emerged when such effects were tested. The effects of gender were modified by culture, those of marital status by gender, those of severity of exposure by SES, and those of personal loss by community destruction. Other times, the effects of certain variables were mediated by other variables; for example, acute stressors increase the likelihood of chronic stressors, which in turn increase the likelihood of psychological distress. Furthermore, some of these effects may be confounded with others; for example, findings that middle-aged adults, parents, and married women are disproportionately distressed all may be capturing the same processes: that caring for others is a source of stress (as well as a source of comfort) in the aftermath of disasters. The state of the art is such that we cannot provide a fully inte-

grated understanding of how all of these factors work together to increase risk. Thus, despite some synergism, we now must think of them as additive and propose that an individual's risk will increase along with the number of risk factors present and decrease along with the number of protective factors present (see Table 2). Models of care, support, and resource provision are needed that allow us to reach out to at-risk adults, such as mothers of young children and persons who are socially isolated or poor. Groups at very low risk, such as older adults, childless men, and high-resource individuals should assume a greater share of the burden for the community's recovery through appropriate volunteer and paraprofessional activities.

With a few modifications, this risk-factor model holds reasonably well for children and adolescents, but the supporting data are fewer and less consistent. Also, the influence of family system variables may be so strong for children that they overpower the influence of other variables. As discussed previously, children attract much-needed attention after disasters, especially through school systems. While such efforts are laudable, interventions designed for them may be of limited effectiveness if the family is not considered as a whole. In fact, providing care and support to their parents might be among the most effective ways to provide care and support to children affected by disasters.

*Resource Dynamics*

Psychosocial resources play a central role in protecting disaster victims' mental health. They undoubtedly account for the overall resilience many, if not most, people show in the face of even quite serious stress. Unfortunately, these same resources are vulnerable to the impact of disasters unless survivors successfully mobilize and sustain those resources that serve to protect and replenish the vulnerable ones. From a resource perspective, the primary goal of postdisaster interventions is to help people replace valued resources as quickly as possible (Hobfoll and Lilly 1993). The longer a loss cycle is allowed to generate momentum, the greater are the resources required to halt that cycle. As resources become

**TABLE 2**
*Individual-Level Risk Factors for Poor Mental Health Outcomes*

| Category | Risk factor |
|---|---|
| Trauma and stress | Severe exposure to the disaster, especially injury, threat to life, and extreme loss. |
| | Living in the context of a neighborhood or community that is highly disrupted or traumatized. |
| | High secondary stress, regardless of whether it is of an acute or chronic nature. |
| Survivor characteristics | Female gender. |
| | If an adult survivor, age in the middle years of 40–60. |
| | Little previous experience relevant to coping with the disaster. |
| | Membership in an ethnic minority group. |
| | Poverty or low socioeconomic status. |
| | Predisaster psychiatric history. |
| Family context | If an adult survivor, the presence of children in the home and, if female, the presence of a spouse. |
| | If child survivor, the presence of parental distress. |
| | The presence of a family member who is significantly distressed. |
| | Interpersonal conflict or lack of supportive atmosphere in the home. |
| Resource context | Lacking or losing beliefs in one's ability to cope and control outcomes. |
| | Possessing few, weak, or deteriorating social resources. |

more depleted, there are too few remaining resources to invest toward their replacement, making positive responses to interventions exceedingly difficult to achieve. There will be times when psychiatrists and other mental health workers might assist victims to develop specifically relevant skills, but it may be most important for these workers simply to reassure survivors that they do, in fact, have what it takes to overcome even this disaster. Service providers must involve the local population in an active and decision-making role rather than in a dependent, victim role. Overall, interventions should emphasize empowerment, meaning they draw upon and build strengths, capabilities, and self-sufficiency.

Naturally occurring social resources are vital for disaster victims. How to enhance social support following a given disaster will vary depending upon the nature of the disaster, setting, and culture, but a few general recommendations can be made on the basis of these results. To prevent loss of social resources, it would be most helpful to keep people in their natural groups if they must be relocated. Returning to normal activities as soon as possible may be important because these activities keep people informed about the relative needs of network members and provide the best forums for the sharing of experiences and feelings that is believed to be so important for disaster victims. One of the basic tenets of crisis counseling is that people need to recognize that some distress is a normal reaction to an abnormal event. What better way to recognize this than through the social comparisons provided by routine social interactions? More importantly, such activities may serve to preserve a sense of continuity, social embeddedness, and quality of community life. It also might be helpful to educate the public about the reasons significant others may not always be able to provide them with the quality or quantity of interpersonal support they expect. Finally, professionals and outsiders should be careful not to undermine natural helping networks. Providing indigenous networks with the resources they need to help one another is (or should be) the primary objective of disaster mental health policy.

## CONCLUDING REMARKS

### *The Need for Effective and Coordinated Mental Health Care*

Disasters are enormously complex events. They affect large numbers of people simultaneously and require public health responses encompassing multiple levels of intervention (societal, community, neighborhood, family, individual) and varying degrees of intensity (psychoeducation for many, treatment for a few). The effects of disasters are diverse and require responses that address a myriad of outcomes, including psychiatric disorders, generalized distress, physical illness, and various interpersonal problems. The aftermath is a motion picture, the effects a moving target—meaning that they unfold in ways that we are not yet able to anticipate precisely, despite some commonalities across events (Somasundaram et al. in press). Different subgroups of the population are more and less likely to be affected and require responses that are tailored to their unique combinations of risk and protective factors.

Given this multidimensional complexity, it perhaps should not be surprising that systems issues reign supreme as barriers to providing disaster victims with effective mental health services. Notwithstanding the critical importance of developing evidenced-based methods of clinical treatment, such approaches will have limited utility if they are embedded in a chaotic system of care. Following major disasters, various federal or national agencies, state or regional offices of public and mental health, substance use prevention and treatment programs, victims services, school systems, universities, media, and various community-based and nongovernmental organizations may all be seeking to play a role in the recovery effort. Issues of coordination and cooperation are very real and are mentioned over and over again by professionals who have found themselves in the position of responding to major events in their communities (Bowencamp 2000; Call and Pfefferbaum 1999; Canterbury and Yule in press; Gillespie and Murty 1994; Hodgkinson and Stewart

1998). There is little, if any, research that addresses these critical issues, and thus there is still much to be learned about how systems-level factors (e.g., coherence, supportiveness) shape providers' abilities to deliver effective services to consumers.

*Issues in Research*

We will close by commenting on disaster research more generally. Disaster research is different from most other fields in that much of the work is motivated by a sense of urgency and concern. Disaster research has both benefited and suffered from this. It has benefited because the cadre of researchers is fluid, and new ideas are accepted and welcomed. It has benefited also because the result has been an impressively diverse database that includes samples from all different regions of the United States, as well as from 28 other countries or territories (and this describes only the research that has been published in English). However, disaster research has also suffered from this situation. Scholarship is not always the best because studies often are undertaken under conditions where there simply is not time to absorb a literature that is scattered across a variety of journals and is mixed in quality. Concerns about experimental designs and scientific rigor must often take a back seat to provider beliefs, consumer demands, and clinical necessities. Most of the research is atheoretical and little of it is programmatic. On the basis of this review, we will state our opinion unequivocally that we do not need more research that establishes *only* that severely exposed disaster victims develop psychological disorders or, worse, that barely exposed disaster victims do not. We need carefully conceived and theory-driven studies of basic process that are longitudinal in design. Prospective designs are highly valued, but prospective studies will confuse more than clarify if the participants were not exposed to a degree where adverse consequences should even be expected. We need more research that addresses the needs of diverse populations. We need more complex studies of family systems and community-level processes. We need to identify and investigate novel approaches to community intervention, where the intervention itself has been designed to produce collective rather than individual improvements. Even more importantly, we need investigators that test their ideas about risk and protective factors via action research and interventions. We need to learn at an operational level how to foster resilience and reduce vulnerability in both specific target populations and in the population at large. We need more collaboration between researchers and practitioners.

We hope that this review has provided future disaster researchers with a comprehensive and organized summary of the state of the art. By having better access to what is known, investigators can focus more readily on filling gaps in this knowledge base. We hope that new researchers will bring insights from other areas that add to our understanding of the processes through which individuals and communities recover from events that, in a perfect world, no one would ever have to experience.

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